



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,348	10/20/2003	Stephan Grunow	TI-36564	4206
23494 7590 02/13/2008 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265				
EXAMINER				
MOVVA, AMAR				
ART UNIT		PAPER NUMBER		
2891				
NOTIFICATION DATE		DELIVERY MODE		
02/13/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

[uspto@ti.com](mailto:uspto@ti.com)

[uspto@dlmail.itg.ti.com](mailto:uspto@dlmail.itg.ti.com)

### Office Action Summary

**Application No.**

10/689,348

**Applicant(s)**

GRUNOW ET AL.

**Examiner**

AMAR MOVVA

**Art Unit**

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-3 and 5-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

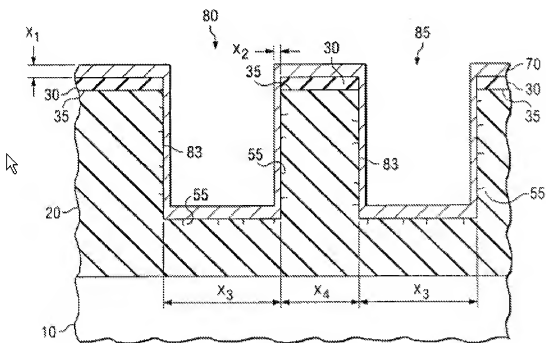
Examiner notes that applicant's independent claims state that the first contiguous barrier layer (70) is formed to thickness X1 over said upper surface (35) of the low K dielectric layer (20) within the trench and X2 on the sidewalls of the trench, wherein the ratio of X1 to X2 is 3:2. The applicable standard for determination of an instance of new matter is that the new claim matter is neither expressly nor inherently disclosed.

Regarding the lack of express disclosure, Applicant's specification discloses a 3:2 ratio vis a vis X1:X2, wherein X1 refers to the barrier layer (70) on the upper surfaces (35) of the low K dielectric outside of the trench (see e.g. fig. 2a reproduced below) and X2 is thickness on the sidewalls of the trench, thus applicant's disclosure only supplies support that the barrier layer is formed to a thickness X1 (ratio 3:2) outside of the trench. While it is possible to, in view of fig. 2a, to find support in applicant's disclosure that a portion of the contiguous barrier layer (70) is thicker in the trench than

Art Unit: 2891

on the sidewalls of the trench it is not sufficient to support a claim that the ratio of  $X_1$  to  $X_2$  is 3:2 with  $X_1$  in the trench.

Furthermore the disclosure does not inherently show a 3:2 ratio since issues that would cause the thicker portion of 70 in the trench vis a vis thicker portion outside of the trench to vary (in PVD and CVD as specified in the specification as the methodology of depositing layer 70) would be poor step coverage depending on the specific materials of the deposition, a lack of knowledge as to what angles were used in the deposition, and whether or not the deposition may have had multiple steps with masks to isolate certain areas for deposition.

*FIG. 2a*

***Response to Arguments***

3. Applicant's arguments filed 10-22-07 have been fully considered but they are not persuasive.

a. Applicant argues that the subject matter in applicant's specification traverses examiner's new matter rejection. Specifically applicant states: "Page 8, lines 4-5 and page 12, lines 4-5 of the original specification literally state that the contiguous liner layer (or barrier layer) is formed in the trenches. Page 8, lines 13-15 further states "In an embodiment X1 represents the thickness of the non- conformal layer 70 formed over the upper surface 35 of the low K dielectric layer 20"." This argument misconstrues examiner's position. Examiner's does not allege that the barrier layer 70 is not in the trench. Rather examiner merely notes that thickness of layer 70 changes in different locations. Layer 70 is X1 above the surface 35, X2 over the sidewalls of the trench, and an unknown thickness at the bottom of the trench. Furthermore applicant's quotation from the original specification stating the X1 barrier layer 70 thickness is above the surface 35 reinforces examiner's position. The surface 35 in fig. 2a is referenced 3 times to the surface outside the trench. Surface 35 is never shown to be in the trench. Therefore the specification expressly only supports a thickness X1 above surface 35, which is outside the trench.

b. Applicant argues that it would have been redundant to re-label the bottom portion of the trench barrier layer since it is the same as the layer 70 over the barrier 30. Applicant's argument illustrates the lack of an express disclosure of

the thickness of the bottom portion of the trench barrier layer. One of ordinary skill in the art would indeed assume that a thickness illustrated in one section of layer is consistent throughout **had the layer been uniform**. However, barrier layer 70 varies in thickness. One of ordinary skill in the art would not read different portions of layer to be both of X1 thickness when an intervening portion of the layer is of a different thickness and thus express labeling of the bottom portion of the trench barrier layer is necessary.

c. Applicant argues that the Examiner's discussion regarding the deposition methodology is not persuasive since a deposition methodology suitable to obtain the claimed result will be utilized. Examiner's explanation of issues of regarding the various deposition methodologies **are the methods as disclosed by application as the methods used in depositing the barrier layer**. Stating a suitable methodology to form a uniform deposition is not sufficient as the claim would raise enablement issues.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMAR MOVVA whose telephone number is (571)272-9009. The examiner can normally be reached on 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley Baumeister can be reached on 571-272-1722. The fax phone

Art Unit: 2891

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amar Movva  
Examiner  
Art Unit 2891

am

/BRADLEY W BAUMEISTER/  
Supervisory Patent Examiner, Art Unit 2891